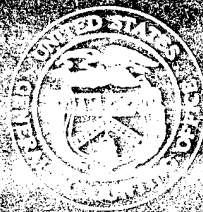
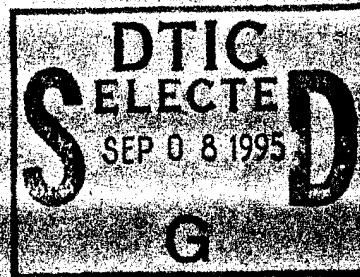


GAO

June 1992

NUCLEAR WEAPONS COMPLEX

Status of Restart Issues at the Rocky Flats Plant



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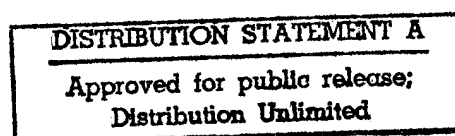
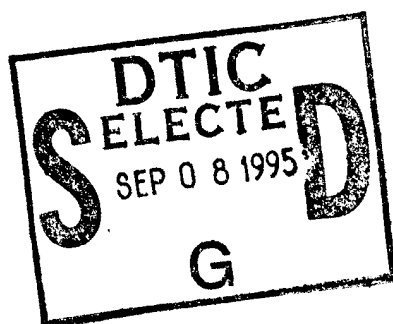
The Honorable Timothy E. Wirth
United States Senate

The Honorable David E. Skaggs
House of Representatives

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On July 15, 1991, you requested that we review the Department of Energy's (DOE) efforts to resume plutonium operations at the Rocky Flats Plant in Golden, Colorado. You specifically asked us to examine DOE's efforts to resolve the environment, safety, and health (ES&H) issues identified before and after plutonium operations were suspended at Rocky Flats in November 1989. As agreed with your offices, this fact sheet provides information on (1) the process that is used at Rocky Flats to identify and manage ES&H issues, (2) the overall status of the ES&H issues at Rocky Flats, and (3) the status of ES&H issues at the buildings where DOE plans to resume plutonium operations.

In summary, EG&G, the contractor that operates the Rocky Flats Plant for DOE, has established an Issues Management Process to identify, evaluate, and resolve ES&H issues. These issues, as defined by DOE, include any question, concern, suggestion, or deficiency that could affect site personnel's safety, the public, the environment, or plant operations. Identified ES&H issues are examined by Rocky Flats' Issues Evaluation Team to determine if the level of risk posed by the issue should be addressed before plutonium operations are restarted at the plant. Issues deemed by the team to have any significant potential to affect plant workers and/or general public safety are designated as resumption issues that are to be resolved before plutonium operations are resumed. Other issues are designated as long-term issues that can be resolved after the restart of plutonium operations.



DEPT QUALITY ASSURED 1

As of May 7, 1992, 2,805 ES&H issues had been identified at the plant by various internal and external reviews.¹ These issues were identified for all plutonium operations buildings under the assumption that Rocky Flats would continue its primary mission of producing plutonium components for nuclear weapons. Of the 2,805 ES&H issues, 1,573 are resumption issues that must be resolved before plutonium operations are resumed, and 1,185 are long-term issues that can be resolved subsequent to restart. The remaining issues are either awaiting initial risk evaluation or have been reopened for further review. DOE has resolved almost 50 percent of the resumption issues and approximately 20 percent of the long-term issues.

Recent events may affect how many of the ES&H issues DOE needs to resolve. Originally, DOE planned to resume operations in six major plutonium operations buildings. However, because of the President's decision to cancel several nuclear weapon systems and their associated warheads, the Secretary of Energy announced in February 1992 that Rocky Flats would undergo a transition from weapons component production to site cleanup. As a result of this shift in Rocky Flats' mission, the Secretary stated that only three buildings--Buildings 371, 559, and 707--will be placed in operation to support plant cleanup. These three buildings account for 666 of the ES&H issues, 406 of which are resumption issues. Activities at the remaining plutonium operations buildings will change to decontamination and decommissioning. Efforts are currently under way at Rocky Flats to assess how these developments will affect the completion of the ES&H issues at each building.

This fact sheet is divided into three sections. Section 1 provides information on the process used to manage ES&H issues from identification to closure. Section 2 provides data on the overall status of ES&H issues at Rocky Flats. Section 3 provides data on the status of ES&H issues that have been identified for the three buildings that DOE now plans to restart.²

¹About 350 of these issues were identified before the shutdown of plutonium operations, and approximately 2,450 were identified after the operations were shut down.

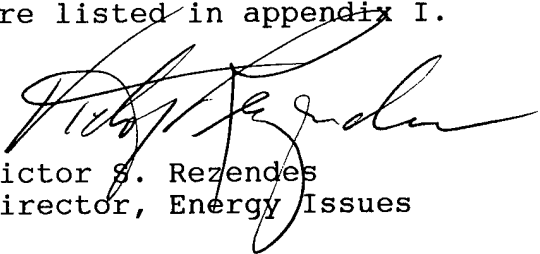
²Building 559--a plutonium laboratory--resumed operations involving plutonium in April 1992.

SCOPE AND METHODOLOGY

The data on ES&H issues presented in this fact sheet were obtained from Rocky Flats' Issues Management Database. This data base is used at the plant to record ES&H issues, compile information on the status of the issues, and monitor them until they are resolved. The data we obtained represent the recorded status of the ES&H issues as of May 7, 1992; we did not attempt to independently verify the data. We also discussed with DOE and contractor officials at Rocky Flats the process for recording and monitoring the ES&H issues. The work for this fact sheet was performed between September 1991 and May 1992. We discussed a draft of this fact sheet with DOE headquarters and Rocky Flats Plant officials and have included their comments where appropriate.

As arranged with your offices, unless you publicly announce its contents earlier, we plan no further distribution of this fact sheet for 30 days from the date of this letter. At that time, we will send copies to appropriate congressional committees; the Secretary of Energy; and the Director, Office of Management and Budget. We will also make copies available to others upon request.

Please contact me at (202) 275-1441 if you or your staff have any questions. Major contributors to this fact sheet are listed in appendix I.



Victor S. Rezendes
Director, Energy Issues

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ABBREVIATIONS

DOE	Department of Energy
ES&H	environment, safety, and health
GAO	General Accounting Office

SECTION 1

ES&H ISSUES MANAGEMENT PROCESS AT ROCKY FLATS

The Rocky Flats Plant located near Denver, Colorado, has processed plutonium and fabricated plutonium components for the nation's nuclear weapons program since 1952. However, plutonium operations at the Rocky Flats plant have been suspended since November 1989 to allow EG&G--the Rocky Flats operating contractor--to make improvements to overall plant safety. Since that time, EG&G has sought to identify and resolve numerous environment, safety, and health (ES&H) concerns that exist at the plant.

To achieve these objectives, EG&G has implemented an Issues Management Process at Rocky Flats to manage the large number of ES&H issues at the plant. The process consists of (1) the identification of ES&H issues, (2) the evaluation of the risk posed by an issue, and (3) work plan implementation and closure.

IDENTIFICATION OF ES&H ISSUES

Potentially significant ES&H issues that may require resolution before the resumption of plutonium operations are identified by Rocky Flats's Issues Management Office. The sources of ES&H issues include both internal sources, such as Technical Safety Appraisals, "Tiger Team" assessments, and internal audits, as well as external sources, such as recommendations and reports of the Defense Nuclear Facilities Safety Board.¹ In addition, Rocky Flats employees can identify possible concerns to the Issues Management Office. New ES&H issues are assigned identification numbers and recorded in the issue-tracking data base. Once recorded, the issues are screened to determine if they are identical or similar to existing ES&H issues. Unique issues that are determined to represent a risk to plutonium operations are forwarded to the Issue Evaluation Team to undergo a risk evaluation.

RISK EVALUATION

EG&G has assembled an Issue Evaluation Team to determine the overall risk that issues pose to the environment and to the safety and health of the public, site personnel, and the facility. The team consists of approximately 15 EG&G officials experienced in the operations conducted at the Rocky Flats facility. The evaluation team calculates the risk level associated with an issue by

¹The Defense Nuclear Facilities Safety Board, which consists of five nuclear safety experts not affiliated with DOE, was established by the Congress to provide independent oversight of safety and health issues at DOE defense nuclear facilities.

evaluating the potential consequences and the probability of their occurrence under six categories: public health and safety, environmental protection, site personnel safety, external confidence and compliance, investment protection and productivity, and mission impact. The risk in each of these categories is totaled to determine the overall risk. Total risk values for issues have ranged from nearly zero to as high as 400.

All issues with a total risk value of 2 or greater are referred to the Rocky Flats Resumption Program Management Office as resumption issues to be completed before the restart of plutonium operations. This risk value threshold for resumption issues is based on a subjective determination by the evaluation team of various risk values and consequences that warrant short-term attention. According to Rocky Flats officials, this risk threshold is very conservative to ensure that issues with high potential consequences, even though they have an extremely low probability of occurring, are included in the resumption plans.

Issues that are below the threshold are referred to the Rocky Flats Operational Improvement Program for implementation after the resumption of plutonium operations has begun. However, before any issue is determined to be a resumption or long-term issue, the recommendation must be reviewed and concurred with by the Technical Advisory Group--a group comprising other EG&G technical experts that advise Rocky Flats management on the resumption program--before they are acted upon by Rocky Flats.

IMPLEMENTATION AND CLOSURE

The Rocky Flats Resumption Program Management Office assigns resumption issues to the appropriate managers to develop "work packages." Work packages outline the work to be performed and the resources needed to resolve an issue or set of issues. After work packages are assembled, managers must submit them to the resumption office for approval. This approval is DOE's method of ensuring that the plan of action will resolve the problem. Once the work package is completed, a site quality assurance group reviews actions taken and verifies that all tasks were performed and that all required documentation is complete. DOE then reviews the documentation and, if satisfied that the ES&H issues have been adequately addressed, the issues are recorded as closed in the tracking system.

SECTION 2

OVERALL STATUS OF ES&H ISSUES AT ROCKY FLATS

Table 2.1: Status of Resumption and Long-term ES&H Issues at Rocky Flats Buildings

Building	<u>Resumption issues</u>		<u>Long-term issues</u>		Issues open for review ^a	Total issues
	Open	Resolved	Open	Resolved		
371	71	16	8	24	0	119
559	3	156	102	22	4	287
707	75	85	76	16	8	260
771	399	231	339	31	5	1,005
776	13	5	5	5	3	31
777	94	5	45	6	0	150
779	90	7	18	0	0	115
Plant-wide ^b	28	247	265	60	24	624
All other build-ings ^c	15	33	87	76	3	214
Total	788	785	945	240	47	2,805

^a"Issues open for review" are issues which have not yet been assessed for their safety significance or have been reopened for further review.

^b"Plantwide" applies to more than one building at Rocky Flats.

^c"All other buildings" consists of 68 buildings at the plant, excluding the buildings listed above and the "plantwide" category.

Table 2.2: Status of Resumption ES&H Issues by Major Category

Category	Status		Total issues
	Resolved	Open	
Glovebox integrity	100	164	264
Fire protection	62	125	187
Facility safety	44	95	139
None assigned	104	28	132
Industrial safety	55	69	124
Criticality alarms	62	34	96
Safety systems	39	51	90
Criticality safety	36	45	81
Radiation protection	42	32	74
As-built configuration	46	26	72
Radiation protection instrumentation	23	48	71
Safety analysis	24	9	33
Hazardous materials control	16	7	23
Tank integrity	0	21	21
Training and certification	20	0	20
Quality assurance	9	9	18
Industrial hygiene	12	5	17
Procedures	10	4	14
Discipline of operations	11	1	12
Management	6	4	10
Emergency preparedness	8	2	10
Waste programs	8	1	9

Emergency response	7	0	7
Maintenance	5	2	7
Waste training	7	0	7
Ductwork safety	3	2	5
Environmental issues	5	0	5
"B"-box integrity/safety	1	3	4
Filter change safety	4	0	4
Human resources	4	0	4
Lessons learned	4	0	4
Corrective actions	3	0	3
Incident reporting	3	0	3
Occupational health	2	0	2
Plumbing	0	1	1
Total	785	788	1,573

Table 2.3: Status of Long-term ES&H Issues by Major Category

Category	Status		Total issues
	Resolved	Open	
None assigned	32	149	181
Fire protection	5	169	174
Industrial safety	33	110	143
Glovebox integrity	5	95	100
Radiation protection	41	45	86
Facility safety	11	49	60
Criticality safety	12	41	53
Environmental issues	12	25	37
Radiation protection instrumentation	9	26	35
Remove excess equipment	6	28	34
Safety analysis	3	29	32
As-built configuration	2	25	27
Waste programs	7	19	26
Emergency preparedness	2	21	23
Hazardous materials control	8	13	21
Safety systems	7	12	19
Criticality alarms	2	14	16
Industrial hygiene	4	12	16
Procedures	8	8	16
Management	5	9	14
Discipline of operations	4	8	12
Maintenance	8	3	11

Quality assurance	0	9	9
Plumbing	1	7	8
Human resources	2	3	5
Corrective action	4	0	4
Emergency response	3	1	4
Formality of operations	2	2	4
Tank integrity	0	4	4
Training and certification	1	2	3
"B"-box integrity/safety	0	2	2
Incident reporting	0	2	2
Occupational health	0	2	2
Filter change safety	1	0	1
Waste training	0	1	1
Total	240	945	1,185

SECTION 3

STATUS OF ES&H ISSUES AT BUILDINGS TO BE RESTARTED

Table 3.1: Status of ES&H Issues at Building 371

Category	<u>Resumption issues</u>			<u>Long-term issues</u>			Issues open for review	Total issues
	Resolved	Open ^a	Total	Resolved	Open	Total		
Radiation protection	0	4	4	15	1	16	0	20
Facility safety	1	15	16	0	2	2	0	18
Safety systems	1	10	11	1	0	1	0	12
Criticality safety	4	7	11	0	0	0	0	11
Fire protection	1	7	8	0	2	2	0	10
Radiation protection instrumentation	2	4	6	2	1	3	0	9
As-built configuration	0	8	8	0	1	1	0	9
Industrial safety	1	3	4	1	1	2	0	6
Criticality alarms	2	3	5	0	0	0	0	5
Safety analysis	1	3	4	0	0	0	0	4
Glovebox integrity	2	1	3	1	0	1	0	4
None assigned	0	1	1	1	0	1	0	2
Discipline of operation	0	1	1	1	0	1	0	2

Quality assurance	0	2	2	0	0	0	0	2
Emergency preparedness	0	0	0	1	0	1	0	1
Environmental issues	0	0	0	1	0	1	0	1
Industrial hygiene	1	0	1	0	0	0	0	1
Management	0	1	1	0	0	0	0	1
Procedures	0	1	1	0	0	0	0	1
Total	16	71	87	24	8	32	0	119

^aExamples of open resumption issues:

1. Identification of ownership and contents of cargo containers, trailers, and sheds is inadequate.
2. Building sprinkler system may not alarm at fire department when a sprinkler is activated.
3. High-noise areas may prevent personnel from being aware of emergency conditions.

Table 3.2: Status of ES&H Issues at Building 559

Category	Resumption issues			Long-term issues			Issues open for review	Total issues
	Resolved	Open ^a	Total	Resolved	Open	Total		
None assigned	48	3	51	13	52	65	4	120
Safety systems	18	0	18	1	2	3	0	21
Facility safety	11	0	11	0	5	5	0	16
Safety analysis	8	0	8	1	7	8	0	16
Criticality alarms	13	0	13	1	1	2	0	15
Criticality safety	11	0	11	1	3	4	0	15
As-built configuration	12	0	12	1	1	2	0	14
Industrial safety	4	0	4	2	5	7	0	11
Fire protection	7	0	7	1	2	3	0	10
Radiation protection instrumentation	7	0	7	0	3	3	0	10
Radiation protection	3	0	3	0	5	5	0	8
Discipline of operation	3	0	3	0	4	4	0	7
Industrial hygiene	2	0	2	0	2	2	0	4
Management	1	0	1	1	2	3	0	4
Procedures	1	0	1	0	3	3	0	4
Glovebox integrity	2	0	2	0	1	1	0	3

Training and certifica- tion	3	0	3	0	0	0	0	3
Emergency preparedness	0	0	0	0	2	2	0	2
Quality assurance	2	0	2	0	0	0	0	2
Human resources	0	0	0	0	1	1	0	1
Environmen- tal issues	0	0	0	0	1	1	0	1
Total	156	3	159	22	102	124	4	287

^aExamples of open resumption issues (these open issues are to be resolved before completion of the building's ongoing startup program):

1. Carcinogen control program has not been implemented in the building.
2. There is no formal facility inspection program.
3. Butterfly valves in exhaust ducts were not properly tagged.

Table 3.3: Status of ES&H Issues at Building 707

Category	Resumption issues			Long-term issues			Issues open for review	Total issues
	Resolved	Open ^a	Total	Resolved	Open	Total		
Facility safety	11	13	24	1	8	9	0	33
Industrial safety	2	12	14	1	13	14	0	28
Glovebox integrity	7	10	17	0	10	10	0	27
Criticality safety	4	8	12	2	12	14	0	26
As-built configuration	18	1	19	0	3	3	0	22
None assigned	3	1	4	1	8	9	8	21
Criticality alarms	12	4	16	0	3	3	0	19
Radiation protection instrumentation	2	6	8	0	8	8	0	16
Safety systems	9	6	15	0	1	1	0	16
Fire protection	7	7	14	1	0	1	0	15
Radiation protection	1	2	3	4	6	10	0	13
Hazardous materials control	2	1	3	2	1	3	0	6
Emergency response	2	0	2	1	0	1	0	3
Safety analysis	1	0	1	2	0	2	0	3
Industrial hygiene	1	0	1	0	1	1	0	2

Plumbing	0	1	1	0	1	1	0	2
Procedures	2	0	2	0	0	0	0	2
Quality assurance	0	2	2	0	0	0	0	2
Maintenance	0	0	0	1	0	1	0	1
Management	1	0	1	0	0	0	0	1
Remove excess equipment	0	0	0	0	1	1	0	1
Waste programs	0	1	1	0	0	0	0	1
Total	85	75	160	16	76	92	8	260

^aExamples of open resumption issues:

1. Design of fire detection panel does not satisfy current back-up power requirements.
2. Fewer than 5 percent of existing process alarm sensors at Rocky Flats are tested for proper operation.
3. Emergency power is not available to some glovebox overheat panels and heat detectors.

MAJOR CONTRIBUTORS TO THIS FACT SHEET

RESOURCES, COMMUNITY, AND ECONOMIC DEVELOPMENT DIVISION,
WASHINGTON, D.C.

James E. Wells, Jr., Associate Director
William F. Fenzel, Assistant Director
John R. Schulze, Assignment Manager

DENVER REGIONAL OFFICE

Mary A. Crenshaw, Evaluator-in-Charge
Alva J. Cain, Evaluator
Cynthia C. Schilling, Reports Analyst